85

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/628,283	07/28/2000	Shinichi Kakiuchi	P19372.A01	3442

7055 7590 12/23/2004

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EXAMINER	
SELBY, GEVELL V	
ART UNIT	**PAPER NUMBER**
2615	

DATE MAILED: 12/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No. 09/628,283	Applicant(s) KAKIUCHI ET AL.
	Examiner Gevell Selby	Art Unit 2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 22 July 2004.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1,8-29 and 31-34 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,8-29 and 31-34 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 28 July 2000 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 3/21/02, 7/22/04.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see the amendment, filed 7/12/04, with respect to the rejection(s)of claim(s) 1, 8-13, 15, 15, 18-22, and 26-29 under 35 U.S.C. 103(a) and claims 1, 2, and 27 under 35 U.S.C. 112, second paragraph have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Ohtomo et al, US 5,995,233.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 8 - 24, 27 - 29, and 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie (1995), in view of Ohtomo et al., US 5,995,233.

In regard to claim 1, Christie (1995), discloses a three-dimensional image capturing device, comprising:

a first light source that radiates a light beam (see figure 1, laser);

an image device that accumulates signal charge corresponding to a quantity of light received on said image device (see figure 1, CCD camera);

a distance information sensing processor (see figure 4, pulse control system) that controls radiating of a distance measuring light beam from said light source to a measurement subject and detects distance information which relates to said measurement subject by receiving a reflected light beam from said measurement subject (see page 1303, last paragraph to page 1304, first paragraph).

The Christie reference lacks a data transmitting processor that controls radiating of a data transmitting light beams from said light source, so that data is transmitted to an external device wherein said light source outputs the distance measuring light beam and the data transmitting light beam in a single operation.

Ohtomo et al., US 5,995,233, discloses a distance measuring device with a light source that radiates data transmitting light beams from said light source, so that data is transmitted to an external device wherein said light source outputs the distance measuring light beam and the data transmitting light beam in a single operation (see column 17, lines 12-20).

It would have been obvious to a person skilled in the art at the time of invention to have been motivated to modify Christie (1995) in view of Ohtomo et al., US 5,995,233, to have a data transmitting processor that controls radiating of a data transmitting light beams from said light source, so that data is transmitted to an external device wherein said light source outputs the distance measuring light

beam and the data transmitting light beam in a single operation in order to simplify the system.

In regard to claim 8, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 2, wherein a series of said distance measuring light beams and a series of said transmitting light beams are superposed (see Ohtomo: column 17, lines 16-20).

In regard to claim 9, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 8 , wherein said distance information sensing processor radiates said distance measuring light beams from said first light source a predetermined number of times, so that signal charge is accumulated in said image device due to each reiterated radiation (see Christie: page 1304, first paragraph).

In regard to claim 10, Christie (1995) in view of Ohtomo et al., US 5,995,233, and further in view of Helms et al., US 6,344,874, discloses a device according to claim 9, wherein timing for radiating said transmitting light beams is based upon the timing of said reiterated radiation of said distance measuring light beams (see Ohtomo: column 13, line 53 to column 14, line 10).

In regard to claim 11, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 10, wherein said series of said distance measuring light beams and said series of said transmitting light beams are superposed, so that said transmitting light beams are radiated in the intervals between said distance measuring light beams (see Ohtomo: column 13, line 53 to column 14, line 10).

In regard to claim 12, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 11, wherein said transmitting light beams comprise a pulse beam representing binary data in predetermined digits (see Ohtomo: column 13, lines 58-61).

In regard to claim 13, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 10, wherein said distance measuring light beams and said transmitting light beams are superposed by pulse-width modulation of said light beams, so that said light beams comprise two types of pulse beams having different widths, which represent binary data of said data and are used for detecting said distance information, concurrently (see Ohtomo: column 13, line 53 to column 14, line 10: The data pulse to recognize a binary bit is 10 times as long as a distance pulse).

In regard to claim 14, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 9, wherein said distance measuring light beam is radiated before an accumulation of signal charge in said image device starts, and signal charge corresponding to said distance information of said measurement subject is accumulated during a period from a beginning of said accumulation to an end of said reflected light beam reception at said image device (see Christie: pg. 1304, first paragraph).

In regard to claim 15, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 14, wherein said transmitting light beam is radiated prior to said distance measuring light beam (see Ohtomo:

figure 20: The previous distance data is transferred before the next distance measurement).

In regard to claim 16, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 15, wherein said transmitting light beam is radiated during a period, from an end of said accumulation of said signal charge in said image device to a beginning of said distance measuring light beam radiation (see Ohtomo: figure 20: The previous distance data is transferred before the next distance measurement)

Distance measuring is part of image capture in the Christie reference. It is implied that the data transfer is done from the end of the last image capture until the distance measuring to start the next image capture when the operations are done sequentially.

In regard to claim 17, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 8 , wherein said distance measuring light beams comprise a synchronizing signal of an optical transmission system (see Ohtomo: figure 19, clock signal of communication data).

In regard to claim 18, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 2, wherein an accumulation of said signal charge in said image device is synchronously carried out with said transmitting light beam, so that said transmitting light beam can be used as said distance measuring light beam as well, and by this, said transmitting light beams and said distance measuring light beams are superposed with each other (see Ohtomo: column 17, lines 16-20.).

In regard to claim 19, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 18, wherein said distance information sensing processor radiates said distance measuring light beams from said first light source a predetermined number of times, so that signal charge is accumulated in said image device due to each reiterated radiation (see Christie: pg. 1304, first paragraph).

In regard to claim 20, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 18, wherein a series of said transmitting light beams represents binary data (see Ohtomo: column 13, lines 58-61).

In regard to claim 21, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 18, wherein said transmitting light beams comprise pulse modulated laser beams (see Ohtomo: column 3, lines 40-46)

In regard to claim 22, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 21, wherein a data sequence transmitted by said transmitting light beams comprises a partition signal that delimits said data sequence by predetermined binary digits of the data (see Ohtomo: figures 18 and 19 and column 13, line 53 to column 14, line 10).

In regard to claim 23, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 18, wherein said image device comprises a plurality of photoelectric conversion elements that accumulates signal charge corresponding to a quantity of light received, and signal charge holding

units disposed adjacent to each of said photoelectric conversion elements (see Christie: pg. 1304, first paragraph).

In regard to claim 24, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 23, wherein the accumulation of said signal charge in said image device begins with a fall of an electric charge discharging signal that discharges the charge accumulated in said photoelectric conversion elements, and ends with a fall of an electric charge transfer signal that transfers said signal charge accumulated in said photoelectric conversion elements to said signal charge holding units (see Christie: pg. 1301, column 2, paragraph 2).

It is implied that a control signal starts the accumulation of signal charge in the image sensor and another control signal stops the accumulation and transfers the signal charge to the distance measuring unit in order to measure the distance of the object. Whether the signals both are activate high or active low is irrelevant because both ways produce the same function.

In regard to claim 27, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 18, wherein the accumulation of said signal charge starts when a pulse of said data transmitting light beam falls (see Ohtomo: figure 19).

It is implied by the Ohtomo reference that when the control signal to the transmitting light beam signal falls or becomes inactive, the distance measuring completes afterwards and since image capture in the Christie reference begins

with distance measuring, the pulse on the transmitting signal would fall before image capture begins.

In regard to claim 28, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 19, wherein said distance information sensing processor and said data transmitting processor are actuated during a distance measuring period, in which said distance measuring light beams are repeatedly radiated said predetermined number of times (see Christie: pg 1304, first paragraph), said distance measuring period comprising:

> a data transmitting period, in which said distance measuring light beams and said transmitting light beams are superposed and radiated (see Ohtomo: column 17, lines 16-20); and
>
> a supplement light emitting period, in which distance measuring light beams are radiated so as to supplement the number of said distance measuring light beams radiated in said data transmitting period, by the number deficient from said predetermined number of times (see Christie: pg. 1304, first paragraph).

It is implied by the Christie reference that the laser will continue to radiate until the same amount of light is radiated each time a distance measurement is taken in order to have the same pulse train for each frame.

In regard to claim 29, Christie (1995) discloses a transmitter comprising a three-dimensional image capturing device (see Christie: figure 1), including a first light source that radiates a light beam (see Christie: figure 1, laser), an image device that accumulates signal charge corresponding to a quantity of light

received on the image device (see Christie: figure 1, CCD camera), a distance information sensing processor (see Christie: figure 4, pulse control system) that controls radiating of a distance measuring light beam from the light source to a measurement subject and detects distance information which relates to the measurement subject by receiving a reflected light beam from the measurement subject (see page 1303, last paragraph to page 1304, first paragraph).

The Christie reference does not disclose a receiver for use in an optical transmission system, a transmitter that cooperates with said receiver, a data transmitting processor that controls radiation of a data transmitting light beams from said light source, so that data is transmitted to said receiver of an external device, wherein said light source outputs the distance measuring light beam and a data transmitting light beam in a single operation; said receiver compromising:

a configuration that receives a data transmitting light beam and that receives a distance measuring light beam;

wherein said receiver starts a data receiving operation when said receiver receives said distance measuring light beam.

Ohtomo et al., US 5,995,233, discloses a receiver for use in an optical transmission system (see figure 13, element 102 and column 11, line 66 to column 12, line 3), a transmitter that cooperates with said receiver (see figure 10, element 100), a data transmitting processor (see figure 17, element 180)that controls radiation of a data transmitting light beams from said light source, so that data is transmitted to said receiver of an external device (see column 13, lines 6-18), wherein said light source outputs the distance measuring light beam and a

data transmitting light beam in a single operation (see column 17, lines 12-19);

said receiver compromising:

a configuration that receives a data transmitting light beam and that receives a distance measuring light beam (see column 12, lines 19-59);

wherein said receiver starts a data receiving operation when said receiver receives said distance measuring light beam (see column 12, lines 31-33).

It would have been obvious to one of ordinary skill in the art at the time of invention to have been motivated to modify Christie (1995) in view of Ohtomo et al., US 5,995,233, to have a receiver, the transmitter cooperate with the receive, and the data transmitting processor as claimed in claim 29, in order to carry out distance measurement and data communication at the same time to make the system more efficient.

In regard to claim 31, Christie (1995) discloses a three-dimensional image capturing device, comprising:

a light source that radiates a light beam (see figure 1, laser);

an image device that accumulates light received on said image device(see figure 1, CCD camera); and

signal charge corresponding to a quantity of a distance information sensing processor that controls radiating of a series of distance measuring light beams from said light source to a measurement subject and detects distance information which relates to said measurement subject by receiving reflected light beams from said measurement subject whereby signal charge is integrated in said image device for each radiation of said

distance measuring light beams (see page 1303, last paragraph to page 1304, first paragraph).

The Christie reference does not disclose wherein said light source outputs a series of data transmitting light beams while radiating said series of distance measuring light beams.

Ohtomo et al., US 5,995,233, discloses a distance measuring system wherein the light source outputs a series of data transmitting light beams while radiating said series of distance measuring light beams (see column 17, lines 12-20).

It would have been obvious to a person skilled in the art at the time of invention to have been motivated to modify Christie (1995) in view of Ohtomo et al., US 5,995,233, to have the light source output a series of data transmitting light beams while radiating said series of distance measuring light beams, in order to simplify the system and save or process data with an external device.

In regard to claim 32, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 31, wherein said data transmitting light beams are output in the intervals between said distance measuring light beams (see Ohtomo: figures 18 and 19 and column 13, line 53 to column 14, line 10).

In regard to claim 33, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 31, wherein said series of distance measuring light beams are subjected to pulse-width modulation to

include said series of data transmitting light beams (see Ohtomo: figures 18 and 19 and column 13, line 53 to column 14, line 10).

In regard to claim 34, Christie (1995) discloses a three-dimensional image capturing device, comprising:

a light source that radiates a light beam(see figure 1, laser);

an image device that accumulates signal charge corresponding to a quantity of light received on said image device (see figure 1, CCD camera);

and a distance information sensing processor that controls radiating of light beams from said light source to a measurement subject and detects distance information which relates to the measurement subject by receiving reflected light beams from the measurement subject (see page 1303, last paragraph to page 1304, first paragraph).

The Christie reference does not disclose that the light beams comprise data transmitting light beams and an accumulation of said signal charge is carried out synchronously with output of said data transmitting light beam from said light source.

Ohtomo et al., US 5,995,233, discloses a distance measuring system wherein the light beams comprise data transmitting light beams and an accumulation of said signal charge is carried out synchronously with output of said data transmitting light beam from said light source (see column 17, lines 12-20).

It would have been obvious to a person skilled in the art at the time of invention to have been motivated to modify Christie (1995) in view of Ohtomo et al., US 5,995,233, to have the light beams comprise data transmitting light beams and an accumulation of said signal charge is carried out synchronously with output of said data transmitting light beam from said light source, in order to simplify the system and save or process the data with an external device.

5. **Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie (1995) in view of Ohtomo et al., US 5,995,233, as applied to claim 1 above, and further in view of Takemura, US 4,831,453.**

In regard to claim 25, Christie (1995) in view of Ohtomo et al., US 5,995,233, discloses a device according to claim 24, but lacks wherein said electric charge transfer signal rises approximately simultaneously with the fall of said electric charge discharging signal.

Takemura, US 4,831,453, discloses an image sensing device with a high speed transfer section wherein said electric charge transfer signal (Figure 7A, element I) is generated by conjunction of a standard electric charge transfer signal comprised of periodic pulse signals (see figure 7B, element P_1 and P_2) and a data synchronizing pulse signal (see figure 6, element H1 or H2) generated synchronously with the fall of a pulse signal of said data sequence;

said electric charge discharging signal (See figure 7C, element S) is generated by conjunction of said data synchronizing pulse signal (see figure 6, element H1 or H2) and a standard electric charge discharging signal (see figure 7B, element Ps) a period of which is the same as said standard electric charge

transfer signal (see figure 7B, element P2) and from which the phase is delayed by a half period; and

said data synchronizing pulse signal is synchronized with said standard electric charge discharging signal (synchronized with reset signal RS) and the pulse width of said data synchronizing pulse signal (see figure 6, element H1 or H2) is the same as one period of said standard electric charge transfer signal (See figure 6D, signal output period).

It would have been obvious to a person skilled in the art to modify Christie (1995) in view of Ohtomo et al., US 5,995,233, as applied to claim 1 above, and further in view of Takemura, US 4,831,453, to have a high speed transfer section so that one-frame images of excellent vertical resolution can be obtained, which are free from flicker even when the object being imaged is in rapid motion as taught by Takemura. Therefore, the device has the electric charge transfer signal rising approximately simultaneously with the fall of said electric charge discharging signal.

In regard to claim 26, Christie (1995) in view of Ohtomo et al., US 5,995,233, and further in view of Takemura, US 4,831,453, discloses the device of claim 25.

Takemura, US 4,831,453, discloses wherein said electric charge transfer signal (Figure 7A, element I) is generated by conjunction of a standard electric charge transfer signal comprised of periodic pulse signals (see figure 7B, element P_1 and P_2) and a data synchronizing pulse signal (see figure 6, element H1 or H2) generated synchronously with the fall of a pulse signal of said data sequence;

said electric charge discharging signal (See figure 7C, element S) is generated by conjunction of said data synchronizing pulse signal (see figure 6, element H1 or H2) and a standard electric charge discharging signal (see figure 7B, element Ps) a period of which is the same as said standard electric charge transfer signal (see figure 7B, element P2) and from which the phase is delayed by a half period; and

said data synchronizing pulse signal is synchronized with said standard electric charge discharging signal (synchronized with reset signal RS) and the pulse width of said data synchronizing pulse signal (see figure 6, element H1 or H2) is the same as one period of said standard electric charge transfer signal (See figure 6D, signal output period).

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gevell Selby whose telephone number is 703-305-8623. The examiner can normally be reached on 8:00 A.M. - 5:30 PM (every other Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on 703-308-9644. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gvs

TUAN HO
PRIMARY EXAMINER